



शोध भूमि

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Effect of Six Months Suryanamaskar Training on Selected Physiological And Motor Fitness Variables of School Going Students of Delhi

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Abstract

The current research was carried out to investigate the impact of targeted Suryanamaskar training for a period of six months on selected motor fitness and physiological parameters-speed and vital capacity-of the school-going children of Delhi. The research was carried out due to the reduction in physical and respiratory efficiencies of adolescents because of their sedentary lifestyle. Suryanamaskar, which is an ancient yogic practice involving a set of body postures performed rhythmically along with breathing, was selected for the training activity due to their holistic benefits.

For conducting the study, an experimental research design utilizing the control group approach was adopted. A group of 40 school-going children in the age group of 13 to 16 years were chosen randomly from Navyug School, Mandir Marg, New Delhi. These subjects were randomly assigned into two separate groups: the Experimental Group that included 20 individuals to be trained in the Suryanamaskar exercise program, and the Control Group that included 20 individuals to be left to their usual schoolwork without engaging in any additional training program, while the Experimental Group was exposed to training in Suryanamaskar exercises for a period of six months.

The speed factor was determined by conducting a 50-yard dash test, while vital capacity was determined by using a spirometer. The pre-test results were recorded before the start of the training program, and the post-test results were recorded upon completion of six months. The mean, standard deviation, and other statistical measures were used, and the results were tested using the t-test at a significance level of 0.05.

The analysis of the results brought to the fore the fact that the Experimental Group demonstrated a significant improvement in speed performance and an increase in vital capacity after the completion of six months of Suryanamaskar exercise, while the Control Group failed to demonstrate significant improvements in speed and vital capacity. The results of the study make an important indication of the fact that the regular practice of Suryanamaskar results in significant improvements in speed and vital capacity in school-going children. It was concluded that six months of systematic training of Suryanamaskar is efficacious in upgrading speed and vital capacity, thus adding to motor fitness and physiological efficiency. This study supports the introduction of Suryanamaskar training as a regular part of school physical training programmes.

Keywords: Suryanamaskar, Speed, Vital Capacity, Motor Fitness, Physiological Variable

Introduction

Motor fitness, or physiological efficiency, is an important aspect of physical development during adolescence. Among different motor faculties, speed is very essential for performing rapid and coordinated actions, while vital capacity is an important physiological index of respiratory efficiency and lung function. During adolescence, it is required that young individuals participate in proper physical activities for proper physiological efficiency. However, during recent times, it has been observed that there has been a decrease in levels of physical activities of students in schooling centers, especially in Delhies, especially regarding motor performance and lung function.

Speed is another major component of motor fitness that entails being able to move from one place to another using the body. Speed is dependent on factors such as neuromuscular coordination, muscular strength, and movement mechanics. Optimization of speed during childhood enhances performance in games and physical exercises. Lack of adequate physical activity may hinder the development of this component in school-going children.

Vital capacity reflects the maximum amount of air that can be forcibly exhaled following a maximal inspiratory effort and is one of the important indicators of respiratory efficacy. A higher vital capacity correlates with enhanced oxygen intake and exercise tolerance capacity. Physical activity and controlled breathing exercises have been found to be important contributors in raising vital capacity values. Inadequate

physical activity of the adolescent period could be a restricting factor in the achievement of optimal respiratory capacity.

In today's school setting, the learning demands as well as the sedentary lifestyle have contributed to a reduced likelihood of engaging in maximal levels of physical activities. Even the normal sports programs in schools today tend to lack the intensity/intervals needed to produce significant improvements in the areas of motor skills and associated physiological outcomes. Hence, the necessity for interventions arises here.

Suryanamaskar is a traditional yogic exercise, which is a set of twelve exercises performed in a rhythmical manner. Suryanamaskar is a combination of body movements along with breathing exercises, which stimulate the musculoskeletal system as well as the respiratory system. The continuous nature of this exercise may help increase speed because of improved neuromuscular coordination, while the respiratory component may help increase vital capacity.

It has been revealed in previous studies related to physical education and yoga sciences that yoga can significantly affect variables of motor fitness and respiration. But most of these studies have the limitation of being related to multiple variables or carried out for short periods of time. It is the need of the hour to conduct long-term research on how Suryanamaskar can affect those variables related to motor and physiological aspects in school-going children. The objective of the current study was hence formed with the aim of investigating the impact of six months of regular Suryanamaskar practice on the speed and vital capacity of school-going children of the capital city of India, Delhi. Utilizing an experimental approach with a control group helps the study make scientific claims on the effectiveness of Suryanamaskar practices for enhancing motor fitness and respiratory capacities of adolescents.

Methodology

The proposed research intends to analyze the impact of Suryanamaskar training carried out under the guidance of the proposed system on speed and vital capacity in school-going children in Delhi. The research procedures followed by the above research were strictly in line with those followed in the first research paper, organized in a manner as per physical education research conventions.

Research Design

An experimental study with a control group was conducted in this study. This study was considered appropriate to evaluate the effectiveness of Suryanamaskar training with regard to differences in speed and vital capacity of the Experimental and Control Groups after six months. Pre-testing and post-testing procedures were adopted to identify the changes due to the training intervention.

Subject Selection

The participants for the study were taken from the students of Navyug School, Mandir Marg, New Delhi. The study selected 40 school-going children in the age group 13-16 years. The participants were randomly assigned into two groups:

- Experimental Group: 20 students
- Control Group: 20 students

The Experimental Group underwent the Suryanamaskar training program, while the Control Group continued their day-to-day school tasks without undergoing any sort of training.

Training Programme

The Experimental Group underwent a structured Suryanamaskar training programme lasting six months. The training sessions were held five days a week, each session lasting nearly 45 minutes. The training included the systematic practice of the twelve Suryanamaskar postures performed in a continuous rhythmical sequence accompanied by breathing. The intensity of the training was varied to allow the body to adapt to it, preventing any tiring or injury. The training sessions were supervised to ensure the exercises were performed correctly.

The Control Group did not participate in any form of Suryanamaskar exercise and followed their normal academic and physical education routine as assigned by their school.

Variable Selection

The independent variable of the study was the Suryanamaskar training program.

The dependent variables selected for the study were:

- Speed (Motor Component – Motor Fitness)
- Vital Capacity (Physiological Variable)

Criterion Measures

These are some of the standardized tests that have been used in measuring variables.

Speed: For speed measurement, the test used was the 50-Yard Dash Test. The time taken to undergo the test was measured in seconds.

Vital Capacity: Vital capacity was measured by a spirometer and expressed in litres.

Collection of Data

The data collection procedure was carried out in two phases. The pre-test was conducted on both Experimental and Control Groups, prior to the commencement of the Suryanamaskar training program. The post-test was carried out after the completion of six months of training. Similar environmental conditions were maintained during the tests in order to have reliable tests. Sufficient rest was provided to the subjects in order to reduce the impact of fatigue, if any.

Statistical Analysis

The data was then subjected to the relevant statistical treatment. Descriptive statistics like Mean and Standard Deviation were determined for both groups at the levels of pre-test and post-test. To find the significance of the difference in means between the levels of pre-test and post-test, the t-test was used and the significance level was set at 0.05.

Data Analysis

The following statistical procedures are employed in the analysis of data:

- Calculation of Mean
- Calculation of Standard Deviation (SD)
- Calculation of Standard Error of Difference (SED)
- Calculation of Standard Error of Mean (SEM)
- Calculation of t-ratio

Calculation of t-ratio These values of t were then compared with the table value of t at 0.05 significance level in order to decide whether or not the results were significantly different.

Results

The outcome of the current study shall be used to determine the impact of the training program of Suryanamaskar on motorfitness and physiological attributes such as speed and vital capacity among school-going children in the state of Delhi.

The data collected from the Experimental and Control groups in respect of pre-cum post-tests at stages of 0 months and 6 months was employed to statistically analyze the Mean, Standard Deviation (SD), Standard Error of Difference (SED), Standard Error of Mean (SEM), and t-ratio. The significance level was set at 0.05.

Table-01(Experimental Group)

| Variables | Subjects | Mean | SD | SED | t-ratio | SEM |
|-----------------------------------|----------|-------|------|------|---------|------|
| Speed (50-Yard Dash – sec) | Pre | 10.15 | 0.55 | 0.22 | 7.50* | 0.16 |
| | Post | 8.50 | 0.60 | | | |
| Vital Capacity (litres) | Pre | 2.65 | 0.35 | 0.08 | 7.10* | 0.06 |
| | Post | 3.20 | 0.30 | | | |

* Significant at 0.05 level

SD = Standard Deviation, SED = Standard Error of Difference, SEM = Standard Error of Mean

Table-02(Control Group)

| Variables | Subjects | Mean | SD | SED | t-ratio | SEM |
|-----------------------------------|----------|-------|------|------|---------|------|
| Speed (50-Yard Dash – sec) | Pre | 10.20 | 0.65 | 0.19 | 0.79 | 0.13 |

| | | | | | | |
|--------------------------------|------|-------|------|------|------|------|
| | Post | 10.05 | 0.60 | | | |
| Vital Capacity (litres) | Pre | 2.60 | 0.40 | 0.09 | 1.36 | 0.06 |
| | Post | 2.68 | 0.38 | | | |

SD = Standard Deviation, SED = Standard Error of Difference, SEM = Standard Error of Mean

Interpretation of Results

From table – 01, it is observed that there were statistically significant increases in speed performance and vital capacity in the Experimental Group after six months of Suryanamaskar training, as the calculated t-ratio values were significant at the 0.05 level. Reduction in time taken for the 50-yard dash testifies to improvement in speed and coordination, and an increase in vital capacity reveals improvement in respiratory efficiency.

Table-02 shows that the control group had no significant difference between the pre-test and post-test in terms of speed and vital capacity. The value of the t-ratio was insignificant, implying that the normal activities of the school were not enough to bring tangible improvement in the chosen motor fitness and physiological components.

Hence, it is evident from the results that there was a positive significant impact of six months of Suryanamaskar practice on the speed and vital capacity of school-going children of Delhi.

Discussion

The current study was conducted to investigate the effect of six months organized Suryanamaskar training on certain motor fitness and physiology variables, namely speed and vital capacity, among school-going children in the city of Delhi. Results obtained from the current study, as discussed in the Results section, convey that the Experimental Group produced statistically significant values for both the variables, whereas the Control Group failed to produce any statistically significant difference during this interval as well.

Effect of Suryanamaskar Training on Speed

Speed ability, measured by the 50-yard dash test, indicated a significant increase in the Experimental Group after the implementation of the Suryanamaskar exercise routine over a period of six months. The decrease in the speed of sprinting at the post-test stage was an indication of enhancement in muscle function and neuromuscular coordination. Speed is affected by the functionality of the nervous system in triggering muscle action, as well as the strength and flexibility of the muscles used in sprinting.

The practice of Suryanamaskar includes rhythmic and continuous movement changes between these postures that demand synchronized activation of various muscle groups at proper intervals. Such dynamic exercises may be responsible for enhanced efficiency and faster performance of tasks involving movement, which may be improving speed performance. The repetitive nature of these movements may also enhance muscular activation and coordination that are critical in improving speed performance.

On the other hand, the Control Group did not display significant improvement in speed performance. This shows that normal school activities and physical education classes were not sufficient to stimulate neuromuscular developments in speed performance. That the significant difference in performance emerged in the Experimental Group can be attributed to the well-organized Suryanamaskar training performed by that group.

Suryanamaskar Exercise Effects on Vital Capacity

Vital capacity has shown statistically significant improvement in the Experimental Group over a period of six months of Suryanamaskar exercise. The increase in vital capacity measures the increased efficiency of breathing. The values of vital capacity get affected by the strength of the muscles of inspiration, elasticity of tissues, and the capacity to control the act of breathing.

Suryanamaskar combines body movement with specific patterns of breathing, which could increase strength in respiratory muscles and lung capacity. Repeated cycles of forced inspiratory and expiratory efforts in different poses of Suryanamaskar could thus have led to an improvement in pulmonary function. These adjustments are more advantageous during puberty, a time of intensive growth of the body.

There was no significant improvement in vital capacity among Control Group patients, and this indicates that usual activities of daily living did not offer enough respiratory exercise for any noticeable difference. The absence of significant difference in Control Group patients once again supports the efficacy of Suryanamaskar for better respiratory function.

General Interpretation of Results

The combined results of this study clearly indicate that there was a significant improvement in the speed as well as vital capacity of the school-going children undergoing Suryanamaskar training. The fact that no significant differences were found in the Control Group confirms that the observed results were not the result of natural growth or normal school activity, but a consequence of the Suryanamaskar training program.

Findings of the study tend to support the interpretations given in the thesis work that emphasize the significance of yogic practices for improving both motor fitness and physiological efficiency. The holistic nature of Suryanamaskar that incorporates

dynamic exercise with regulated breathing enables it to serve as an effective tool for successful trainings that aim for both speed improvement and breathing efficiency. Thus, the results are indicative of the effectiveness of including Suryanamaskar as an integral part of physical education instructions at schools with the goal of improving the movement coordination abilities as well as the respiratory efficiency of the school-going adolescents.

CONCLUSION

Based on the findings of the present study, it can be concluded that six months of systematic Suryanamaskar training has a significant positive effect on selected motor fitness and physiological variables, namely speed and vital capacity, of school-going students of Delhi. The Experimental Group, which underwent regular and structured Suryanamaskar training, showed a statistically significant improvement in speed performance and a significant increase in vital capacity, whereas the Control Group did not exhibit significant changes in these variables during the same period.

Improvement in speed was quit high, which reflects improvement in neuromuscular coordination and efficiency of movement of the students participating in the training programme. Suryanamaskar exerts better impact on the development of speed through improvements in muscle activation patterns and coordination due to its dynamic and rhythmic movements. Similarly, the significant increase in vital capacity suggests improved respiratory efficiency and lung function; this could be for the fact that Suryanamaskar combines deep, regulated breathing with physical movement.

In fact, no significant changes were noted in the Control Group, which clears the notion that routine school activities themselves cannot produce significant improvements in speed and respiratory efficiency. This clearly establishes that the improvements noted in the Experimental Group were an outcome of the structural Suryanamaskar training programme itself and not as a result of growth or daily physical activity.

The findings of the present study have underlined the comprehensive role of Suryanamaskar as a cost-effective and easily applicable physical activity in a school environment. It is all the more suitable for inclusion in a school physical education program because it does not require much space and equipment. In this view, the study recommends the inclusion of Suryanamaskar as a regular practice in training for motor fitness and respiratory health among school-going adolescents.

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